are to be used in designing the containment area to be developed by the extraction wellfield.

Because of the addition of reinjection as a component of the project, ARARs pertaining to reinjection of extracted and treated groundwater were identified. Specifically mentioned was the "Statement of Policy with Respect to Maintaining High Quality of Waters in California," which requires that reinjected water not degrade existing water quality.

The additional cost due to ESD1 changes in the interim remedy were estimated at $8.8 million over 20 years (in 1990 dollars).

IV. Summary of Additional Significant Differences (ESD2)

Based on additional study of the local (Burbank OU) groundwater system by Lockheed Martin, and by EPA's consultant CH2M Hill, EPA has concluded that an extraction rate of 9,000 gpm results in substantially the same level of groundwater containment as an extraction rate of 12,000 gpm. Overall costs are reduced at the lower extraction rate, because the need to construct and operate expensive reinjection facilities is eliminated. Cost effectiveness is improved because the lower extraction rate makes it less likely that the upper groundwater zone will become de-watered, and thus will allow EPA to achieve its goal of preferentially pumping the most contaminated zones. Based on these factors, EPA has lowered the interim remedy extraction rate to 9,000 gpm.

EPA has decided to eliminate reinjection as a requirement based on projections that there will essentially be no excess water at the revised groundwater extraction rate. The City of Burbank can substantially accept, and has committed to accept, an average of 9,000 gpm from the interim remedy facilities.

Due to elimination of reinjection from the project, the Burbank OU groundwater extraction rate will not be a continuous 9,000 gpm. The instantaneous extraction rate will fluctuate with the City of Burbank's water demand. In recognition of the likelihood that it will not be possible to extract groundwater at a rate of 9,000 gpm, twenty-four hours a day, three hundred and sixty-five days a year, EPA is specifying that the new extraction rate will be achieved as an average rate, not an instantaneous rate.

EPA has also decided to suspend the 9,000 gpm extraction rate requirement during times when nitrate levels in the extracted groundwater exceed 50 mg/l as nitrate. The ability to maintain an annual extraction rate of 9,000 gpm is not only dependent on the City of Burbank's water demand, but also upon nitrate concentrations in the extracted groundwater. It is possible that

these concentrations may rise high enough such that, during periods of low water demand, it is not possible to extract an average of 9,000 gpm and also meet the nitrate MCL. EPA's analysis suggests that even under the worst case scenario for nitrates, an average of 8,500 gpm would be pumped. EPA believes the interim remedy will continue to be protective of human health and the environment even at this slightly reduced groundwater extraction rate, which, if it occurs, will only occur on an occasional basis.

EPA estimates that changes to the interim remedy effected by ESD2 will reduce implementation costs by $49 million (1995 dollars).

Further, the City of Burbank holds a public water supply operating permit, issued by the California Department of Health Services. This permit has been amended to cover operation of the Burbank OU treatment facilities. The requirements of this permit will govern off-site requirements for drinking water protectiveness.

V. Declaration

The selected remedy, as modified by this ESD, is protective of human health and the environment, attains federal and state requirements that are applicable, or relevant and appropriate, to this interim remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances as a principal element. It also complies with the statutory preference for remedies that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. As part of the remedy, groundwater monitoring will be conducted to track contaminant levels at the Burbank Operable Unit and to monitor the performance of the extraction and treatment system in order to ensure adequate protection of human health and the environment.

Keith Takata — 2-12-97

Keith Takata
Director, Superfund Division

Date

San Fernando Valley Area 1, Burbank Operable Unit

SECOND EXPLANATION OF SIGNIFICANT DIFFERENCES
February 12, 1997

I. Introduction

On June 30, 1989, the U.S. Environmental Protection Agency (EPA) signed a Record of Decision (ROD) for the San Fernando Valley Area 1 Superfund Site, Burbank Operable Unit (Burbank OU). On November 21, 1990, EPA signed an Explanation of Significant Differences (ESD1) modifying the interim remedial action selected in the ROD. The purpose of this Second Explanation of Significant Differences (ESD2) is to explain additional modifications to the interim remedial action.

Under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986, and pursuant to 40 C.F.R. Sec. 300.435(c)(2)(i)(55 Fed. Reg. 8666, 8852 (March 8, 1990)), EPA is required to publish an Explanation of Significant Differences when significant (but not fundamental) changes are made to a final remedial action plan as described in a ROD.

This document provides a brief background of the Site, a summary of the remedy selected in the Burbank OU ROD, a summary of changes made to the remedy by ESD1, a description of the changes to the remedy EPA is making in this ESD2 (including how the changes affect and better refine the remedy selected in the ROD), and an explanation of why EPA is making these changes.

EPA is issuing ESD2 in order to take into account technical data received after ESD1 was signed in November, 1990. The changes are: (1) Based on additional study of the local (Burbank OU) groundwater system, EPA has concluded that an extraction rate of 9,000 gallons per minute (gpm) results in substantially the same level of groundwater containment as an extraction rate of 12,000 gpm. Therefore, the interim remedy extraction rate has been reduced to 9,000 gpm; (2) EPA is specifying that the new extraction rate will be achieved as an average rate, not an instantaneous rate; (3) EPA has decided to eliminate reinjection as a requirement based on projections that, on an annual basis, there will be no excess water at the revised groundwater extraction rate; and, (4) EPA has decided that the specified average extraction rate need not be met during times when nitrate levels in the extracted groundwater exceed 50 mg/l, because under this circumstance a greater quantity of blending water will be

required, leaving the City of Burbank less capacity to accept extracted groundwater for use as a public water supply.

ESD2 and the supporting documentation will become part of the Burbank OU Administrative Record. Copies of the Administrative Record have been placed at the following locations:

City of Burbank Public Library
110 North Glenoaks Boulevard
Burbank, CA 91502
818-953-9737

City of Glendale Public Library
222 East Harvard Street
Glendale, CA 91205
818-956-2027

II. Background

A. Site background and description

The following gives a brief background of the Burbank OU and a short summary of the remedy selected in the ROD and modified by ESD1. Further background information can be found in the ROD (dated June 30, 1989), and in ESD1 (dated November 20, 1990), as well as in other documents in the Burbank OU Administrative Record.

In June 1986, EPA evaluated the threat posed by groundwater contamination at a number of water supply wellfields within the San Fernando Valley and Verdugo groundwater basins. The chief contaminants of concern are trichloroethylene (TCE) and perchloroethylene (PCE). As a result of its investigation, EPA designated four wellfield areas as National Priorities List (NPL) sites. EPA is managing the four sites as a single project consistent with CERCLA Section 104(d)(4).

The San Fernando Valley Groundwater Basin has historically been an important source of drinking water for the Los Angeles metropolitan area, including the City of Burbank. The groundwater basin provides enough water to serve approximately 600,000 residents.

Groundwater extracted from the basin is especially important during years of drought. Due to contamination by volatile organic chemicals (VOCs), including TCE and PCE, beneficial use of the groundwater resource has been partially lost. Surface water supplies have replaced the lost resource, but are costly, and may not be available in the future due to periodic drought conditions and the potential for changing water rights policy.

The Burbank OU is located within the San Fernando Valley groundwater basin and encompasses wellfields which were operated by the City of Burbank prior to being shut down as a result of contamination. The Burbank OU was specifically developed to address this areal extent of groundwater contamination.

The City of Burbank's production wells have been shut down since the early 1980s because of the presence of TCE and PCE in concentrations exceeding federal and state Maximum Contaminant Levels (MCLs). Consequently, the city purchases close to one hundred percent of its water from the Metropolitan Water District of Southern California, which supplies surface water imported from outside the San Fernando basin. (The city does operate a granular activated carbon groundwater extraction and treatment plant during parts of the year, but the contribution of this plant toward meeting the overall water demand is small.)

B. Selected remedy as modified by ESD1

The Burbank OU ROD selected the interim remedy for an area of groundwater contamination generally located within the San Fernando Valley Area 1 Superfund Site. The ROD selected extraction of contaminated groundwater, treatment by air or steam stripping, and use of the treated water as a public water supply by the City of Burbank. The interim remedy was estimated to cost $69 million over the 20 year planned length of the interim remedy. ESD1 added the requirement to blend the extracted, treated, water with a lower nitrate source in order to meet nitrate MCLs. ESD1 also added the requirement for reinjection of excess water that the city could not accept due to water demand limitations. The changes to the interim remedy caused by ESD1 were estimated to cost $8.8 million, raising the total estimated project cost to $77.8 million (in 1989/1990 dollars).

Based on analyses conducted by the Los Angeles Department of Water and Power, through their consultant James M. Montgomery, in the Burbank OU Feasibility Study, the ROD specified that groundwater would be extracted and treated at a rate of 12,000 gpm. This rate was considered necessary in order to control plume migration and to initiate aquifer restoration. The 12,000 gpm rate was projected to hydraulically contain groundwater having a concentration of 100 parts per billion (ppb) of TCE and 5 ppb of PCE. ESD1 clarified that these levels are not treatment goals to be attained in groundwater, but are to be used in designing the containment area to be developed by the extraction wellfield.

The ROD states that the treated water must meet all existing federal and state MCLs and State Action Levels (SALs). It also states that the water must meet all drinking water treatment technology requirements. The treated water is being delivered to

the City of Burbank's distribution system for use as a public water supply. Use of the treated water in this manner is considered preferable to discharging the water to waste because it restores the groundwater resource to beneficial use.

With respect to meeting drinking water standards, ESD1 concluded that, based on new information suggesting high nitrate levels in the groundwater, additional measures were required to meet the MCL for nitrate in the extracted and treated water. EPA decided to require blending of the extracted and treated groundwater with a water supply lower in nitrates, such that the MCL is achieved in water served to the public.

Addition of the nitrate blending requirement raised the possibility that the City of Burbank would not be able to accept the total quantity of water produced by the interim remedy. This is because nitrate blending raises water production, from the initially anticipated rate of 12,000 gpm, to a rate as high as 24,000 gpm. Under ESD1, EPA decided to require reinjection of any excess water, or water the City of Burbank could not use as a public water supply due to insufficient demand. EPA also identified Applicable or Relevant and Appropriate Requirements (ARARs) pertaining to reinjection of extracted and treated groundwater, specifically, the "Statement of Policy with Respect to Maintaining High Quality of Waters in California," which requires that reinjected water not degrade existing water quality.

Under ESD1, EPA also clarified that the interim remedy could be designed, constructed, and operated in phases. Phasing the project allows for initial completion of a portion of the total extraction wellfield and capacity treatment plant capacity. Operation of this first phase of the project allows collection of data on aquifer response and treatment plant efficiency. This data helps the design engineer to optimize the design of the following project phases, and helps to optimize overall groundwater containment and treatment efficiency for the project.

Portions of the Burbank OU ROD and ESD1 have already been implemented through a 1992 Consent Decree and a Unilateral Administrative Order. EPA also made additional operational changes in the interim remedy in the 1992 consent decree, which was approved by the Central District of California federal court. The 1992 consent decree, captioned United States of America v. Lockheed Corporation et al., Civil Action No. 91-4527 MRP(Tx), is included in the Administrative Record.

Under the Consent Decree, Lockheed Martin and the City of Burbank have constructed the first phase of the interim remedy. Under the Unilateral Administrative Order, a group of parties associated with six other Burbank facilities have constructed the

blending facility, the purpose of which is to reduce nitrates in the extracted, treated groundwater. The first phase of the interim remedy was completed and became operational in January 1996. The first phase consists of groundwater extraction and treatment at a rate of 6,000 gpm, blending with Metropolitan Water District water, and use of the treated, blended water as a public water supply.

III. Summary of Significant Differences

ESD2 provides for the following changes to the interim remedy:

1) EPA has lowered the interim remedy extraction rate to 9,000 gpm. Based on additional study of the local (Burbank OU) groundwater system during the Remedial Design phase, EPA has concluded that an extraction rate of 9,000 gpm results in substantially the same level of groundwater containment as an extraction rate of 12,000 gpm. Cost effectiveness is improved at the lower extraction rate, not only due to the reduced cost of pumping less water, but because the need to construct and operate expensive reinjection facilities is eliminated. In addition, the lower extraction rate makes it less likely that the upper groundwater zone will become de-watered, and thus will allow EPA to achieve its goal of preferentially pumping the most contaminated zones.

2) EPA has decided to eliminate reinjection as a requirement. This decision is based on projections that, under existing aquifer conditions, there will be no excess water (i.e. water that cannot be used by the City of Burbank as a public water supply) produced at the revised groundwater extraction rate. The City of Burbank has committed to accept an annual average of 9,000 gpm from the interim remedy facilities.

3) EPA is specifying that the 9,000 gpm extraction rate will be achieved as an average rate, not as an instantaneous rate. Due to elimination of reinjection, the instantaneous rate will fluctuate with the City of Burbank's water demand. EPA recognizes that it will not be possible to extract groundwater at a rate of 9,000 gpm, twenty-four hours a day, three hundred and sixty-five days a year. However, EPA's analysis suggests that under the worst case scenario for nitrates, groundwater can be extracted at a minimum rate of 8,500 gpm. EPA believes protectiveness of human health and the environment is maintained even at this slightly reduced rate, which, if necessary, will only be necessary on an occasional basis. In order to maximize the amount of groundwater pumped, EPA has decided to count groundwater extraction from the city's granular activated carbon treatment plant toward the 9,000 gpm average rate. This wellfield will most likely be used by the city during the summer

to meet peak water demand. The City of Burbank has agreed to maximize its use of treated groundwater. These decisions and agreements are to be included in a second consent decree between EPA, the city, and numerous Burbank parties.

4) EPA has decided to suspend the 9,000 gpm extraction rate requirement during times when nitrate levels in the extracted groundwater exceed 50 mg/l as nitrate. This decision is being made to ensure that under no circumstances will the MCL for nitrate be exceeded in the treated water. The ability to maintain an annual extraction rate of 9,000 gpm is not only dependent on the City of Burbank's water demand, but also upon nitrate concentrations in the extracted groundwater and in the blending water. It is possible that these concentrations may rise high enough such that, during periods of low water demand, it is not possible to extract an average of 9,000 gpm and also meet the nitrate MCL. However, as mentioned in the above paragraph, the City of Burbank has agreed to maximize its use of treated groundwater.

Lockheed Martin has estimated that changes to the interim remedy effected by ESD2 will reduce implementation costs by 49 million dollars (1995 dollars), and EPA is in agreement with this estimate.

IV. Explanation and Detailed Description of Changes and Clarifications

After the ROD and ESD1 were signed, EPA received and reviewed new data from its Alternative Remedial Contracting Strategy (ARCS) contractor CH2M Hill, from the City of Burbank, and from the Lockheed Martin Corporation, regarding the Burbank OU groundwater system. This new information included both data collected in the field (from groundwater monitoring wells) and the output from computer modeling exercises. Reports and technical memoranda were generated compiling this data, which project that the implementation of ESD2 will not reduce the protectiveness of the Burbank OU interim remedy. Thus, EPA's conclusion in the ROD and ESD1 that the interim remedy is protective of human health and the environment has not changed. The new and existing technical information that EPA relied upon to prepare ESD2 is identified in the discussion which follows, and this information can be found in the Burbank OU Administrative Record.

A. Background

Based on this new information, EPA has concluded that a lower pumping rate than originally projected will result in the desired degree of containment of the VOC contaminant plume in the vicinity of the Burbank OU. This projection results from an

improved ability on EPA's part to predict aquifer response to pumping, made possible because real operating data is now available from Phase 1 of the Burbank OU interim remedy, which includes a 6,000 gpm groundwater extraction wellfield. In addition, the local groundwater flow models designed by CH2M Hill and by Lockheed Martin have undergone additional improvement and verification since the ROD was written. Results from both models predict that a 9,000 gpm extraction rate achieves the goals of the ROD.

EPA believes it is important to implement this change not only because it is based on sound scientific analysis, but also because of cost savings to the project. Reducing the pumping rate allows for elimination of costly reinjection facilities required under ESD1. The lower pumping rate also ensures that EPA will be able to pump from the most contaminated zones of the aquifer without dewatering the aquifer.

EPA, with the assistance of CH2M Hill, the City of Burbank, and Lockheed Martin, performed the following analysis in reaching these conclusions.

B. Options

While CERCLA Section 117(c) and 40 C.F.R. Section 300.435(c)(2)(i) merely require an explanation of significant differences and the reason for these differences, ESD2 sets out in detail four options regarding the rate of groundwater extraction, along with EPA's analysis of these options. The four options are as follows:

1. Extraction and treatment of an annual average of 6,000 gpm of groundwater from the existing Phase 1 Burbank OU wellfield, with use of the treated water by the City of Burbank (this phase of the project is currently in operation; therefore, if Option 1 were selected, no further construction would be required at the Burbank OU);

2. Extraction and treatment of an annual average of 9,000 gpm of groundwater from the existing Phase 1 Burbank OU wellfield, and the planned Phase 2 wellfield, with use of the treated water by the City of Burbank;

3. Extraction and treatment of an annual average of 12,000 gpm of groundwater from the existing Phase 1 and proposed Phase 2 and Phase 3 Burbank OU wellfields, with use of the treated water by the City of Burbank, with conveyance of excess water to other purveyors;

4. Extraction and treatment of an annual average of 12,000 gpm of groundwater from the existing Phase 1 and proposed Phase 2 and

Phase 3 Burbank OU wellfields, with use of the treated water by the City of Burbank, and reinjection of excess water (this is the option selected by the ROD as modified by ESD1).

C. Analysis of options

The four options presented above were compared with each other based on the nine criteria listed and explained in the National Contingency Plan (NCP), 40 C.F.R. Section 300.430(e)(9)(iii). The nine criteria and the results of the comparison of the options are presented in this subsection. The nine criteria are as follows:

1. compliance with ARARs
2. overall protection of human health and the environment
3. short-term effectiveness in protecting human health and the environment
4. long-term effectiveness and permanence in protecting human health and the environment
5. reduction of toxicity, mobility, and volume of contaminants
6. technical and administrative feasibility of implementation
7. capital and operation and maintenance costs
8. state acceptance
9. community acceptance

An analysis of the four options in terms of the above criteria follows.

1. Compliance with ARARs

The Burbank OU ROD recognizes that chemical-specific ARARs for the groundwater itself will be addressed in the final remedy. The remedial action adopted pursuant to the ROD, ESD1, and ESD2, is an interim action; therefore, chemical-specific ARARs for the groundwater contaminant plume do not apply to the activities taken pursuant to the ROD, ESD1, and ESD2.

However, for each of the four options being considered, drinking water standards, including state and federal MCLs, source water monitoring protocols, and treatment technology requirements, must be met. The existing treatment plant designed under Phase 1 has been shown to meet these standards during operation at flows up to 6,000 gpm. Option 1 is essentially Phase 1 of the Burbank OU interim remedy, which EPA has previously concluded meets drinking water ARARs.

The Phase 1 Burbank OU treatment plant is currently being operated to meet all standard state drinking water requirements